DURLAND · VAN VOORHIS
architects

January 14, 2011

Paul F. Dawson, Town Administrator
Town of Marion
2 Spring Street
Marion, MA 02738

Re: Marion Town House Existing Conditions Assessment

Dear Mr. Dawson:

While there have been a series of improvements made to the Town House over the past several years, including new roofs, gutter repairs, boiler replacement and the painting of the tower, the vast majority of the systems in the building are quite old and many have reached the end of their serviceable life. It seems that many of the improvements that have been made happened as the need arose rather than as part of a larger plan - these include the data wiring, lighting upgrades and interior finishes. Some of the improvements like the vinyl siding, suspended ceilings, plywood wall paneling and aluminum panning have concealed much of the original detailing of the building and obscured the logic of the original structure.

Durland ▪ Van Voorhis Architects specializes in historic preservation and the renovation of historically significant properties. Our experience has shown us that the renovation of historic buildings not only is often cost effective, but also makes environmental sense by preserving the embodied energy of existing facilities rather than consuming new resources to recreate new space. Carefully targeting work that reduces the operating expenses like heat and electricity make renovation even more economical that building new. Historically the Marion Town House has played an important role in the development of Marion Village, serving as the first permanent home of Tabor Academy, and preserving that legacy for future residents is a worthy goal.

## Overview

Over a series of several weeks beginning in early November 2010, members of our staff visited, inspected, measured, and photographed the Town House. The information gleaned from these visits helped us assess

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the existing conditions, prepare accurate scaled drawings, and develop a detailed 3D computer model of the building.

On December 10, 2010 and again on December 17, 2010 I toured the facility with our consulting engineers. The first visit was with Mr. Alan Ankers, PE of Boston Building Consultants (BBC), our structural engineer and the second was with Carlos DeSousa PE, Christopher Garcia PE and David Hipolito of Garcia, Galuska, DeSousa - Consulting Engineers (GGD). After these inspections, both firms prepared reports assessing the condition of the building.

BBC's report focused on the structural integrity of the building and even though the building is in generally good condition, recommended a series of framing repairs in the basement. GGD's reports discuss the condition of the fire protection, plumbing, HVAC and electrical systems. Recommendations and cost estimates for those improvements were also prepared for these systems. Copies of these reports as well as scale drawings with photos keyed to the report follow. Although not technically part of our work, we have also included a copy of GAF Engineering's recently completed water infiltration survey of the Town House. This reports identities important steps that should be taken immediately to limit water infiltration into the building.

What becomes clear from all of these various reports is that while the building has served the town well for many years, there are a several areas where the Town House would benefit from a comprehensive set of repairs. The most urgent needs are improved site drainage, window repair, heating and ventilation upgrades, and various accessibility improvements.

We have included an estimate of the cost of a comprehensive renovation of the entire facility. This preliminary figure identifies the ball bark of what a complete renovation might cost. We recognize that a phased approach may be more in line with the town's current financial situation and, therefore, have identified the most important improvements, prioritized them for discussion, and provided corresponding cost estimates for each.

## Recommendations

Based on the various assessments there are a few recommendations that merit special attention. One involves the site drainage and more specifically roof runoff. The entire storm water system, beginning with the gutters, downspouts, drains and ultimately the subsurface piping, needs to be repaired and/or replaced and put back in good working order. Additionally a perimeter drainage system should be installed and the grade positively pitched to shed water away from the building. Installing this system will also provide a

good opportunity to remove many of the large plantings that are currently too close to the building. GAF's report has outlined additional steps that should be taken to stop water infiltration into the basement. As they point out in their report, this work needs to be completed before any mold remediation work will have any lasting effect.

Boston Building Consultants has also identified five or six structural deficiencies, framing repairs, all in the basement, which should be corrected. These repairs are detailed further in their report that follows and keyed to the basement plan. Even though none of these problems are life threatening, these repairs are a high priority and should be repaired in the near term.

Another set of recommendations involves some of the steps that can be taken to reduce the current energy consumption and improve the quality of the interior environment. These would include upgrading or installing new insulation in the floors, walls and roofs, repairing the windows and doors, installing modern lighting controls and mechanical systems as well as upgrading the heating distribution system - currently the steam piping is not insulated. A more in depth description of the mechanical, electrical and plumbing recommendations is detailed in GGD's reports that follow.

A final recommendation is to improve the level of accessibility within the Town House. Currently the two main first floor levels can only be accessed by using the exterior ramps, and the toilet rooms are only accessible form the lower level by going outside. Currently the basement, second and third floors are not accessible at all. A new elevator, grade entrance and new toilet rooms could resolve many of these deficiencies. An accessible grade entrance and elevator lobby at the south side of the link might be one way of correcting this deficiency. Signage, door hardware, and public counters are also substandard and should be made accessible.

In a slightly different category from the other suggestions is one of the easiest recommendations to make. However, an annual maintenance plan is also one of the most challenging to execute consistently. The routine inspection of roofs, gutters, downspouts, and drains is necessary to identify and correct small problems before they result in expensive repairs. In addition, we would recommend regular checks for other visible signs of concern including the presence of water, any wear or damage and evidence of active animal infestations.

## Safety & Code Compliance

The building currently complies with the code technically. Because it was constructed and subsequently improved in accordance with the codes in effect at those times, the building complies with the code; however, new work will need to be built to comply with the current code. Any new project must comply with the 8th Edition of the Massachusetts State Building Code, the ADA and the Massachusetts Architectural Access Board Regulations.

Life safety improvements like the installation of a fire suppression system, the upgrading of the fire alarm system or enclosed stairways would now be required for a new building of this type and size, as would complete handicap accessibility. The codes do require these upgrades for existing buildings that undergo significant renovation, but not for smaller projects. Another factor to consider is that some work may actually trigger other work, morphing a smaller project into something much bigger, and because of this some items are best considered together. For example a new accessible elevator will require an upgrade to both the electrical service as well as the fire alarm.

## Phasing

While larger projects are often able to take advantages of efficiencies of scale, larger projects are often beyond the financial reach of many owners. A comprehensive renovation project would certainly be more efficient than several smaller projects, but it would also come with a higher cost. For information purposes only, I have prepared a preliminary cost estimate for such a project.

Without a large-scale renovation project there is still a real need for a long-term renovation plan to coordinate multiple incremental improvements. To facilitate thinking on this, I have organized a set of logical steps or standalone projects and given each of them a relative priority rank.

While the previous section discusses a scenario where multiple pieces of the larger project trigger other bits, there are many parts that are really independent and can be treated as single discreet projects regardless of what else is done. A new site drainage system, window repairs, structural repairs, and the upgrading of interior finishes are standalone projects and could be done as resources allow.

There are a few options for phasing the work that would impact the length of the project, the inconvenience of relocation and the cost of temporary facilities. One option would be to relocate all departments and close the building to complete all of the work at one time. This will increase the cost of temporary space but lower the total cost of construction. It will also confine the disruption to the shortest possible time.

Another option would be to renovate each of the two major wings, one at a time, and temporarily relocate to the other side or another site, if necessary. Difficulty in changing electrical service or heating and ventilating systems in the occupied building is one problem with this approach, but not insurmountable.

## Cost information

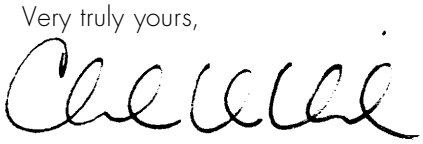
To facilitate this discussion I have provided two cost estimates – one for a complete project and the other for individual smaller projects. The first helps establish the magnitude of a complete project, while the other shows the relative size of some of the smaller pieces. The latter has been organized in order of priority and should be used as a tool to weigh the costs and benefits of different project configurations.

Cost must be weighed over the short and long term as well as against lifecycle costs and operational cost impacts. Other factors to consider include human comfort and its impact on efficiency as well as the environmental impact of repair versus replacement of the building or individual components.

Please feel free to call me to review this report, and I would be happy to meet with you, the Selectmen, Capital Planning Committee or any other interest board to discuss these issues. I look forward to continuing our work with you on this important project.

If you have any questions or need additional information, please do not hesitate to call me.

Very truly yours,



Charlie Van Voorhis, RA LEED AP
Principal

# EXISTING CONDITIONS ASSESSMENT

JANUARY 14, 2011

# Marion Town House

## 2 Spring Street
## Marion, Massachusetts
## 02738

Prepared by

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# ARCHITECTURAL SURVEY

## Roofing:

There are two different roof types on the Town House. Gray asphalt strip shingles are present at the steeper pitches on both the main building (photo 1&2) as well as the west wing (photo 3). There are also several low-pitch roofs (photos 3 & 4) that are covered with fully-adhered rubber membrane roofing. It appears that insulation board has been fastened to the roof sheathing in most of these areas.

The asphalt shingles are grey single-tab strip shingles, 3'- 0" long. They are in generally in good condition, most appear less than 15 years old. The tower roof (photo 2) seems to be newer than the rest perhaps within the last five years.

The rubber roofs appear to be relatively new and are in generally good condition.

While there are areas of water damage inside, it is believed that the leaks have been repaired and none are currently active.

The flashings are concealed and their condition is not known at this time. It is reasonable to believe that they were replaced at the same time as the roofs.

Regular semi-annual inspections are required for good long term roof maintenance. A regular fall and spring inspection would be a minimal first step.

1/XL-1.1 - Northeast corner of Town House

2/X-1.5 - Tower roof

3/X-1.5 - Rubber roof on link

4/X-1.5 - Rubber roof (upper) & asphalt strip shingle (lower & dormer)

## ARCHITECTURAL SURVEY

### Exterior Doors:

Virtually all of the original wooden exterior doors have been replaced with fully glazed black anodized aluminum store front units. However, the original wooden half-round four-light transoms still remain in place.

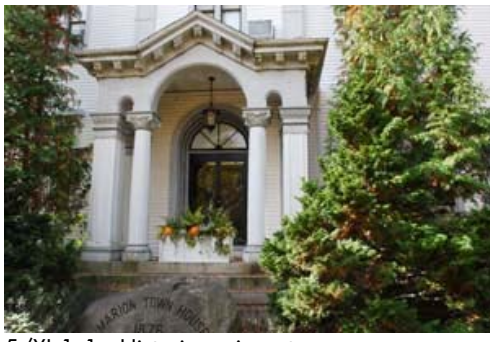
Two exceptions are the bulkhead door on the west side of the building (photo 12) and an old original basement double door under the south entrance (photo 11). Both of these doors are in fair condition and need repainting.

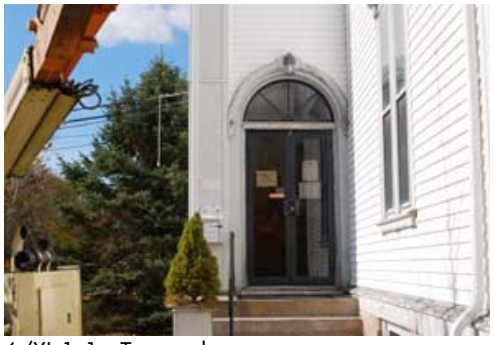
Only the north side doors (photos 8 &9) are wide enough to be accessible, the other double doors on the main building are so small that the single leaves can be difficult to get through comfortably.

It is not know whether the doors and frames are thermally broken. If not their thermal performance could be significantly improved by replacement.

While certainly functional, both the size and design of the doors could be improved. A change in the size would help make the building more functional and a change of configuration would make the doors more sympathetic to the historic detailing of the building.

While the hardware appears to be accessible the large thresholds should be modified to conform with both the ADA and MAAB guidelines.


5/XL-1.1 - Historic main entrance


6/XL-1.1 - Tower door


7/XL-1.1 - North door


8/XL-1.1 - Accessible north door

ARCHITECTURAL SURVEY

Exterior Doors (continued):

The basement door can be use as a guide for any new replacement doors. In Photo 10 the contrast between the original opening with its glazed sidelights and transom and the new aluminum storefront door is quite noticeable.

9/X-1.2 - Accessible upper level north door

10/XL-1.1 - "Assembly" hall south door

11/X-1.1 - Basement south door

12/XL-1.1 - Basement service door

## ARCHITECTURAL SURVEY

### Windows:

The vast majority of the original wooden windows remain in place through out the building. Typically the windows are double hung, 1 over 1 on the main building and 6 over 2 at the first floor and 8 over 8 in the basement of the hall addition. They have pulley and weight balances. There are a few fixed transom windows above the doors and in the foundation as well as on the third floor dormers.

There are a pair of double hung windows in the town administrators office (photo 22) and a single double hung on the third floor (photo 21) that have been replaced, but the rest of the windows appear to be original.

Triple track aluminum storm windows are typical at the first floor windows only (photo 17). There are few if any screens for the windows.

There are also a few specialty windows – colored glass casements off of the upper main hall (photo 24) and a series of leaded glass hopper windows in the town administrator's office. (photo 22)

The windows do not appear to have any weather stripping and many of them no longer lock well. They are a major source of air infiltration in their current condition.

While there are currently none installed, many of the windows appear to have had interior shutters and there a quite a few of the units are stored in the basement and attic.

The exterior head casings at the main building have been covered with aluminum panning, most likely to prevent water infiltration at the joint with the exterior wall. When this panning was installed, the historic details were concealed or removed.

17/X-1.2 - Typical first floor window

18/X-1.2 - Round top window @ doorways

19/X-1.3 - Typical round top double-hung windows at second floor

20/X-1.4 - Third floor windows at dormer

## ARCHITECTURAL SURVEY

### Exterior Trim:

The exterior wood trim is generally good condition and gives the entire building its distinctive architectural style. The handsome window and door casings, powerful eave brackets, quoins (currently covered by aluminum panning), and tower are hall marks of the Italianate Style of architecture that was so popular in the decades following the Civil War. While the paint finish is in poor to fair condition all of the visible trim is very good condition. The lower layers of paint likely contain lead and should be treated accordingly by skilled professionals.

It would be interesting to try to document the original colors to determine whether they could be used as part of a long-term restoration of the building. All of the trim should be carefully scarped, sanded, primed, caulked and painted with a high quality oil based primer and two coats of latex exterior paint.


13/XL-1.2 - Historic detail & trim


14/X-1.2 - Typical first floor window casing


15/XL-1.1 -Eave & tower details

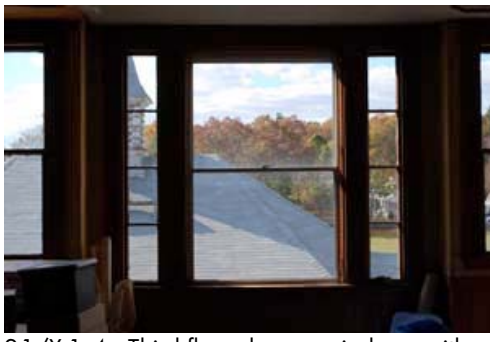

16/X-1.2 - Window casing bracket

ARCHITECTURAL SURVEY

Windows (continued):

The wood windows are in need of significant repair. This would include removing the glass, repairing, scraping, sanding and priming the sash, re-glazing the windows and finish painting the units. In addition, the windows should be completely weather-stripped and the weight balances either repaired or replaced with spring balances.

New latches and pulls should be installed as well as screens and removable exterior storm windows to improve energy efficiency.



21/X-1.4 - Third floor dormer windows with replacement double-hung at center

22/X-1.2 - Leaded windows with replacement double-hungs at center

23/X-1.2 - Typical first floor wood double-hung window with plastic interior "storm"

24/X-1.2 - Colored glass casement @ firs flr

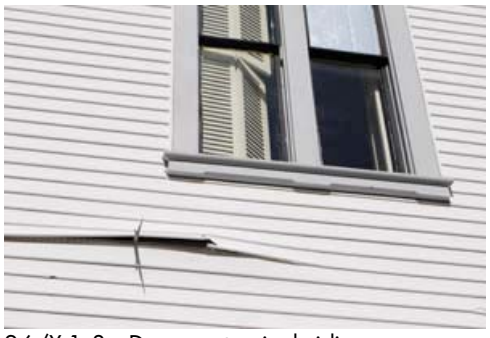
ARCHITECTURAL SURVEY

## Siding:

Virtually all of the entire exterior of the building has been covered with vinyl siding. It is not clear whether some or all of the original siding remains in place or was removed as part of the re-siding work. There are a few areas in the dormers (photos 20 & 28) where some of the original shingle siding and decorative detail remain and are visible above the vinyl. Some of the vinyl siding has been removed on the tower (photo 27) and wood clapboard siding is visible in that location.

There are several areas where the vinyl has been damaged (photos 25 & 26) likely by wind-borne debris or falling ice and snow. The condition of the wall underneath is not clear. A common problem with vinyl siding on older buildings is moisture buildup underneath because of the absence of a suitable vapor barrier and the lack of proper insulation. Both of those systems should be carefully studied before any significant work is done on the siding. In the mean time the small holes should be patched with new vinyl siding.

25/X-1.2 - Minor damage to vinyl siding



26/X-1.3 - Damage to vinyl siding

27/X-1.4 - Original clapboard at east wall of tower

28/X-1.2 - Original siding at peak of south entry gable roof

ARCHITECTURAL SURVEY

Foundation:

The foundation has two courses (one 12" high on top and one 24" high on the bottom) of rough-hewn granite blocks above grade and a rubble base below. The granite has the distinctive pink color like so much of the stone in the area.

The foundation is in very good condition (see the structural assessment which follows) with no signs of significant movement.

In select areas where water has infiltrated the structure, the mortar is damaged or missing entirely.


29/X-1.1 - Granite foundation


30/X-1.1 - Granite stair & foundation


31/X-1.1 - Rubble foundation below grade


32/X-1.1 - Rubble foundation below grade

ARCHITECTURAL SURVEY

Exterior Stairs:

The existing exterior stairs are made from slid blocks of granite on top of a rubble fill. The joints between adjacent treads and risers are mortared. The rise and run, while not what the code would require today, is not excessively steep and the treads are ample.

The handrails are also not what the code would require today, but seem to suffice. The handrails should be a larger dimension to comply with accessibility regulations and be located on both sides of the stair instead of just one as they are currently. The balusters at the hall stair have spaces more than the four inches currently required by code.

The joints between many of the stones have eroded and require repointing or new caulking to limit water penetration


33/X-1.2 - Main historic granite stair


34/XL-1.1 - South tower stair


35/XL-1.1 - North stair


36/XL-1.1 - South assembly hall stair

## ARCHITECTURAL SURVEY

### Ramps:

The accessible ramps along the north side of the building are made of pressure-treated posts, stringers and railings with composite decking. The ramps do not appear to be more than 15-20 years old and are in very good condition. They do not meet some of the dimensional requirements of the current code – size of turning platforms must be a minimum of 60" in both directions. The spacing between balusters is also larger than the four inches currently allowed.

The ramps serve only two doors on the north side of the building, one at each first floor level and can only be accessed from the northeast corner of the west parking lot. The ramps are quite long and can be quite slippery in the winter.

37/XL-1.1 - Typical railing detail at ramps

38/XL-1.1 - Accessible ramp to lower level at north side of building

39/XL-1.1 - Accessible ramp to upper level at north side of building

40/XL-1.1 Accessible ramp at north side of building

## ARCHITECTURAL SURVEY

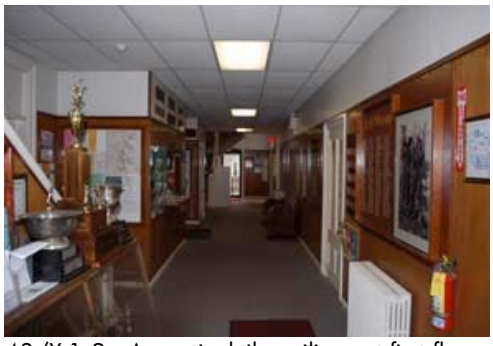
### Ceilings:

Most of the original ceilings in the buildings were plaster (photo 42) in both the hall addition as well as the main building. On the second floor of the main building there are tin ceilings (photo 41) in the old classroom spaces. However, these ceilings are obscured by acoustical tile ceilings in the east side classrooms. The first floor of the main building has acoustical tile ceilings (photo 43) throughout. Two exceptions to this are the meeting room ceiling that is plaster and the Town Administrator's ceiling (photo 44) which is plaster and wood.

The plaster ceilings are all in need of minor patching and repair, none more than those on the third floor (photo 42).

41/X-1.3 - Tin ceiling with minor damage at second floor

42/X-1.4 - Plaster ceiling damage at third floor



43/X-1.2 - Acoustical tile ceilings at first floor

44/X-1.2 - Wood panel ceiling at first floor office

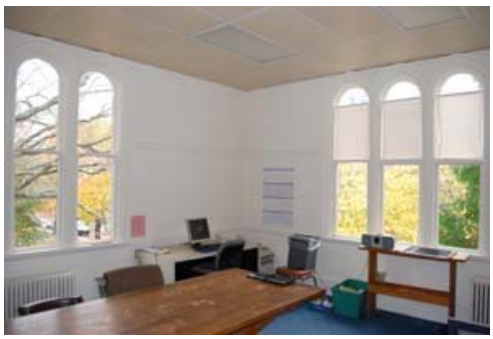
ARCHITECTURAL SURVEY

Interior Walls:

The original plaster finish of the interior walls in the Town House is generally in very good condition. There are a few select areas where water has damaged that plaster (photo 45), but in the vast majority of the building the plaster has a well-maintained paint finish. Only the third floor that has not been used very recently has large cracks and areas of failed plaster where only the wood lath remains.

The rest of the building has been very well maintained and the painted walls are in good condition of their age (photo 46). On the first floor some of the walls may be in worse condition but it is difficult to know with certainty since they have been covered with plywood paneling (photo 47). There are several newer interior partitions in the upper hall that have a painted gypsum board finish (photo 48) and these are also in very good condition.


45/X-1.4 - Painted plaster walls at third floor


46/X-1.3 - Painted plaster walls at second floor office

47/X-1.2 - Plywood paneling & glazed oak partition at lower level of first floor


48/X-1.2 - Gypsum wall board partitions at upper level of first floor

ARCHITECTURAL SURVEY

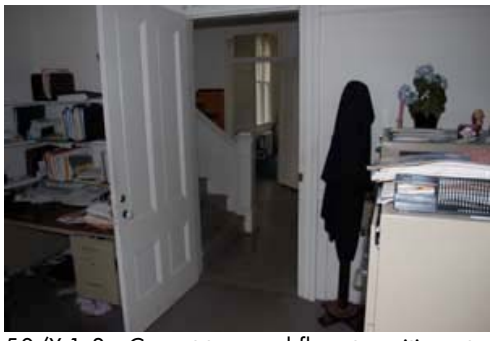
## Flooring:

The building originally had wood floors (photo 49) and there are a few locations, the third floor and stairways, where those floors are still visible (photo 51). Since the conversion from a school to an office building, the floors have been covered with carpet to "quiet" the spaces (photo52). Vinyl tile has been installed in the toilet rooms.

Permanent interior floor mats would help protect the carpet through out and more durable finishes at public counters would help preserve those areas of higher wear.

So long as the building maintains its office function carpet seems the best appropriate finish. Routine vacuuming, cleaning and shampooing will increase the life of any installation. The painted finish visible in the stair ways (photo 51) while attractive requires higher maintenance and probably should be avoided.

49/X-1.4 - Wood strip floor at third floor hall



50/X-1.3 - Carpet to wood floor transition at second floor office

51/X-1.3 - Original painted wood plank floor at second floor with vinyl tile in toilet room

52/X-1.2 - Typical carpeted floor

## ARCHITECTURAL SURVEY

### Interior Trim:

With the exception of some modern alterations, the interior wood trim appears to be original to the building. From the areas like the basement, third floor and assembly hall where the trim remains clear finished (photos 53, 55 & 56) the wood appears to be pine. Much of the trim has been painted (photo 54) and it is very likely that some of those older coats will contain lead. There are distinctive profiles for the window and door trim, as well as for the wainscot at each floor.

Because the building has been well maintained the interior finishes are in very good condition and require only minimal touch up or cleaning. There are several distinct patterns and profiles that change from floor to floor. These different trim packages provide visual interest and should be retained as part of any future renovation project.

53/X-1.4 - Clear finished wood window trim & wainscot at third floor

54/X-1.3 - Painted interior wood trim typical, shown here at second floor office

55/X-1.2 - Clear finished trim at upper level assembly hall

56/X-1.2 - Clear finished decorative column at assembly hall

## ARCHITECTURAL SURVEY

### Interior Doors:

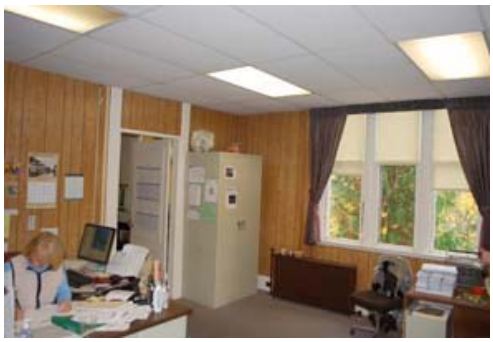
There are several different styles of door scattered throughout the Town House from various improvements across a number of years. In the main building the most common type is a four-panel wood door (photos 57 & 58) with a mortised lock set and decorative knob-styled handles, while in the west wing a five-panel (photo 60) wood door is more common.

There are also several hollow core flush wood doors (photo 58) sprinkled throughout the building. Many doors currently have thresholds that exceed the limits of current accessibility regulations. These should be modified as necessary to remove these barriers throughout the building.

The doors are all in good working order, however, the hardware is typically non-accessible. It would be best to change over the entire building all at once rather than a few doors at a time. This will prevent the hardware upgrade from having a piecemeal look.

57/X-1.4 - Clear finished 4-panel interior wood door

58/X-1.3 - New clear finished flush wood door & double 4-panel painted wood door



59/X-1.3 - 4-panel interior wood door

60/X-1.2 - 4 & 5-panel interior wood doors

## ARCHITECTURAL SURVEY

### Accessibility:

Only the first floor is currently accessible and this is by a series of ramps on the back side of the building. What appear to be the main doors are not accessible. Furthermore the only accessible route between the upper and lower level of the main floor is outside. There is currently a set of five steps (photo 62) that separate the two levels.

The basement, second and third floors are only reachable by stairs (photos 61 & 63), so those floors are presently inaccessible. The public counters at the building department, assessor and the town clerk are not fully accessible either. These should be modified as part of any interior renovation.

The installation of an elevator should also be considered to provide access to the basement, second and third floors. Given the existing plan the likely location would probably be at the link between the main building and hall addition. This will require further study to minimize its impact on the historic qualities of the building.

61/X-1.2 - Inaccessible south tower door & second floor stairway


62/X-1.2 - Five riser change in elevation from lower to upper levels on first floor


63/X-1.1 - Inaccessible basement stair


64/X-1.2 - Counter @ Building Department

PRELIMINARY PROJECT COST ESTIMATE

| TRADE | COST | % Constr | $/sf |
|---|---|---|---|
| DIVISION 2 - SITEWORK | $250,260 | 7.4% | $14.92 |
| DIVISION 3 - CONCRETE | 38,100 | 1.1% | 2.27 |
| DIVISION 4 - UNIT MASONRY | 45,180 | 1.3% | 2.69 |
| DIVISION 5 - METALS | 25,345 | 0.7% | 1.51 |
| DIVISION 6 - WOOD AND PLASTICS | 225,206 | 6.6% | 13.43 |
| DIVISION 7 - THERMAL MOISTURE PROTECTION | 183,955 | 5.4% | 10.97 |
| DIVISION 8 - DOORS AND WINDOWS | 501,400 | 14.8% | 29.89 |
| DIVISION 9 - FINISHES | 476,353 | 14.0% | 28.40 |
| DIVISION 10 - SPECIALTIES | 22,150 | 0.7% | 1.32 |
| DIVISION 11 - EQUIPMENT | 18,000 | 0.5% | 1.07 |
| DIVISION 12 - FURNISHINGS | 5,575 | 0.2% | 0.33 |
| DIVISION 13 - SPECIAL CONSTRUCTION | 0 | 0.0% | 0.00 |
| DIVISION 14 - CONVEYING SYSTEMS | 98,000 | 2.9% | 5.84 |
| DIVISION 15 - MECHANICAL | 1,025,976 | 30.2% | 61.16 |
| DIVISION 16 - ELECTRICAL | 480,075 | 14.1% | 28.62 |
| DIRECT COST | $3,395,575 | 100.0% | $202.43 |
| GENERAL CONDITIONS | $237,690 | 7.0% | $14.17 |
| GENERAL ADMINISTRATIVE O&P | 135,823 | 4.0% | 8.10 |
| P&P BOND | 50,934 | 1.5% | 3.04 |
| DESIGN CONTINGENCY | 339,558 | 10.0% | 20.24 |
| ESCALATION - Fall 2011 | 135,823 | 4.0% | 8.10 |
| TOTAL CONSTRUCTION COST | $4,295,402 | | $256.08 |
| A/E FEES | $429,540 | 10.0% | |
| CONSTRUCTION CONTINGENCY | 322,155 | 7.5% | |
| BIDDING/ADVERTISEMENT | 5,000 | | |
| TESTING | 20,000 | | |
| OPM/CLERK OF WORKS | 120,000 | | |
| TEMP FACILITY/MOVING EXPENSES | 50,000 | | |
| TOTAL PROJECT COST | $5,242,098 | | $312.51 |

## COST ESTIMATE BY PROJECT

| Task | Cost | Alternative | Priority |
|---|---|---|---|
| • Perform structural repairs | 15,000 | | 1 |
| • Re-point foundation | 20,000 | | 1 |
| • Re-grade around perimeter of building, repair storm drain, & install perimeter drainage | 45,000 | | 1 |
| • Repair gutters & downspouts | 50,000 | | 1 |
| • Repair existing windows & install exterior storm windows | 398,000 | Install replacement windows | 1 |
| • Insulate exterior walls & roofs | 71,000 | | 1 |
| • Install new fire protection system (sprinklers) | 100,000 | | 1.1 |
| • Fire alarm & exit signage | 56,925 | | 1.1 |
| • Install new siding | 115,000 | Patch existing vinyl siding | 2 |
| • Create accessible entrance with elevator access to upper floor levels | 450,000 | Add 2 interior lifts | 2 |
| • Repaint exterior wood siding & trim | 45,000 | | 2 |
| • Install new carpeting | 75,000 | | 2 |
| • Upgrade interior doors & hardware | 45,000 | | 2 |
| • Plumbing upgrades | 105,800 | | 2.1 |
| • Heating upgrades | 592,410 | | 2.2 |
| • Electrical service & distribution upgrades | 232,200 | | 2.3 |
| • Replace exterior doors | 35,000 | | 3 |
| • Paint interior walls & trim | 50,000 | | 3 |
| • Restore interior wall & ceiling finishes | 25,000 | | 3 |
| • Air-conditioning | 208,950 | | 3.1 |
| • New HVAC wiring | 31,050 | | 3.1 |
| • New security system | 62,100 | | 3.2 |
| • New Voice/data infrastructure | 82,800 | | 3.3 |

B O S T O N
**B U I L D I N G**
**CONSULTANTS**
241 A Street
Boston, Massachusetts 02210
617 / 542 - 3933
Fax: 617 / 426 - 8922

December 14, 2010

Mr. Charles Van Voorhis
Durland • Van Voorhis Architects
628 Pleasant Street, Suite 322
New Bedford, MA 02740

Re: **Marion Town House** **BBC job No. 10115**
2 Spring Street
Marion, MA

Dear Charlie,

At your request, I met with you at the above-referenced site on Friday December 10, 2010 and conducted a brief walk-through to review the structural condition of the building.

**Overview**
The Town House complex consists of two connected buildings that were originally used for educational purposes as part of Tabor Academy. The east wing, with three above-ground floors, is the older building, dating from the late 19th century. The west wing has only a single above-ground floor, but much of its floor space is significantly higher than the east wing.

Both buildings appear to be entirely wood-framed above the foundation. The roof configurations are relatively complex with multiple hips and dormers. Most of the structural framing is concealed by wall and ceiling finishes, the exceptions being the first floor framing visible in the basement, and small portions around the edge of the roof of the east wing.

**General Condition**
Since the majority of the structural framing is concealed, it is not possible to comment on its condition without significant exploratory investigation involving removal of wall and ceiling finishes. In general however, the building appears to be in relatively good condition, and there are no obvious signs of structural distress. There are a few minor cracks visible in partitions, and some of the floors have noticeable sags or feel "bouncy" but these generally seem typical for buildings of this age and construction type. Localized situations with more significant issues are discussed individually below.

**Foundations**
The perimeter foundation walls of both buildings are constructed of stone: granite block for the upper portion above and just below grade; mortared rubble stone for the lower portion. No significant settlement of the foundation is evident, suggesting that it is stable. In some areas, mortar has fallen out of the joints between the stones, most likely as a result of water penetration. It should be a relatively simple matter to repair these joints.

**First Floor Framing**
The majority of the first floor framing, for both buildings, is exposed in the basement. The floors of the two buildings are at different levels, with the west wing about three feet higher.

The typical framing is 2x wood joists (sizes vary with different spans) framing into the sides of heavier wood beams up to 8"x12" in size. The joists typically run in an east-west direction, except for the easternmost bay of the east wing, which is framed north-south. The wood beams are typically supported by the exterior foundation walls and brick masonry piers (generally 8"x12") in the interior.

There are a few locations where supplementary supports have been added under the floor beams or joists, with either wood posts or steel Lally columns or screw jacks. In some cases these have clearly been installed in response to problems with the framing. In some other cases there is no obvious defect and the reason for installing the supplementary support is unclear. There may have been deflection of floor joists causing concern, or perhaps the need to locally support heavy equipment. In general, where this supplementary framing is supported by steel posts or screw jacks, we recommend leaving in place except for those instances noted in the final section "Suggested Repairs." Wood posts in the basement seem to be susceptible to water damage, and we recommend replacing them with steel, as noted below.

**Second Floor Framing**
The second floor framing in the east wing is mostly unknown. It is likely that some of the walls function as bearing walls, although the arrangement of bearing walls above first floor does not match the layout of the major first floor beams as might be expected. We suspect that the direction of joist framing matches that of the first floor, but on the west side, the joist spans are probably twice as long as on the first floor.

**Third Floor Framing**
The east wing's third floor appears to have been neither used nor maintained since the building was passed on to the town, reportedly in 1937. It was clearly used (and intended for such use) as classroom space prior to that. There are some cracks in the plaster partitions of up to ½" in width, but these appear to be fairly old. They would represent more of a concern if there were indications of ongoing movement. The cracks are most likely the result of a combination of shrinkage (as the wood initially dried out) and creep over time, together with expected deflections on relatively long spans.

The design live loads mandated by the current building code are essentially the same for business offices and school classrooms, so it is reasonable to conclude that this floor is suitable for use as office space. If a more definitive assessment of the capacity is required, a significant portion the structure will need to be exposed to facilitate an investigative survey.

**Roofs**
The roofs of both buildings have multiple hips and dormers. The configuration of major framing members and their means of support is not clear.

The west wing appears to have four major columns surrounding the central space. Presumably, the hip beams and rafters are supported by beams running between these columns.

In the east wing, there are two vertical metal rods within the west side classroom that appear to be part of a major wood truss spanning the full length of the building and supporting the roof and third floor. This roughly coincides with the change in slope of the roof, with a shallower slope in the central portion. It would appear that some other interior supports would be required, but it is not clear where they are.

**Suggested Repairs**
The following repairs are suggested for the framing in the basement, with locations identified on the key plan.

S1. The existing 12"x8" brick pier has suffered significant loss of mortar from its joints. It also has no header bricks in one of the short faces, apparently having originally been built into a wall that projected beyond it at both sides. The mortar joints should be repaired and some header bricks substituted for the cut bricks at the quarter points of the pier. The beam bearing on the pier should be temporarily supported while this work is carried out.

S2. The main floor beam here is supported by a short cross-header between two brick piers, but the beam has failed in shear at the half-lap splice joint over the header. Temporary support framing with screw jacks has been added under the joists at one side of the beam, and a nearby wood post that does not appear to have originally been intended as structural is now carrying much of the load. We recommend installing a new steel column (or masonry pier) and footing under the beam about two feet south of the cross-header.

S3. The main wood beam is supported by a wood post close to the foundation. The beam bearing probably suffered some water damage in the past. To avoid issues with rot of the bottom of the wood post, we recommend replacing it with a steel column (or masonry pier) and a new footing.

S4. One of the 2x12 floor joists is heavily cracked. A new full length 2x12 joist should be sistered alongside the existing.

S5. There are two adjacent joists that are damaged in this location; one has been partially reinforced by a short piece of plywood. Both joists should be reinforced with new full length 2x12 joists sistered alongside the existing.

If you have any questions or require additional information, please do not hesitate to call.

Sincerely,
**Boston Building Consultants**

Alan L. Ankers, P.E.

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Marion Town House
Marion, Massachusetts
Existing Conditions Systems Report
J# 879 022 00
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**FIRE PROTECTION**

**Existing Conditions:**

Currently the building does not contain an automatic sprinkler system.

In general, Massachusetts General Law M.G.L. c.148, s.26G requires that any existing building over 7,500 square feet that undergoes ***major*** alterations or modifications must be sprinklered.

If any future proposed scope of work is considered a major alteration, an automatic sprinkler system is required for the building

A hydrant flow test will be required to evaluate water supply capacities.

TEL 508-998-5700 FAX 508-998-0883 email: info@g-g-d.com

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Consulting Engineers Inc.
370 Faunce Corner Road, Dartmouth, MA 02747-1217

PROJECT: Marion Town House
JOB NO: 610 004 00.00
CLIENT: DVV
DATE: 12/21/2010 BY: CGD

## CONSTRUCTION COST ESTIMATE

| ITEM No. | ITEM OF WORK | PRIORITY | QTY. | UNIT PRICE | PRICE/S.F. | AREA (G.S.F.) | TOTAL |
|---|---|---|---|---|---|---|---|
| 1 | Install automatic sprinkler system. | *contingent on project scope | - | SF | $4.50 | 20,737 | $93,316.50 |
| 2 | New fire service | *contingent on project scope | 1 | Lump Sum | - | - | $7,500.00 |
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**TOTAL Fire Protection System Cost** ***$100,816.50***

Notes:

1. Priority 1 = 0-1 Year; Priority 2 = 2-5 Years; Priority 3 = 5-10 Years recommended for system improvements.
2. Cost estimates are based on recent project costs with similar Fire Protection systems.

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Marion Town House
Marion, Massachusetts
Existing Conditions Systems Report
J# 879 022 00
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## PLUMBING

### Executive Summary

Presently, the Plumbing Systems serving the building are cold water, sanitary, waste and vent system, and natural gas. Municipal sewer and municipal water service the Building.

In general the plumbing fixtures are in fair condition. The plumbing fixtures do not appear to meet current accessibility codes. and are not water conservation fixtures. Use of water conservation fixtures is governed by the provisions of the Plumbing and Building Code. Essentially, the code does not require these fixtures to be upgraded, but where new fixtures are installed, as may be required by other codes or concerns, the new fixtures need to be water conserving type fixtures.

Cast iron is used for sanitary drainage. Rainwater from roof areas is collected by gutters and downspouts which either discharge to grade or are collected by a below grade piping system. There are no interior rain leaders. Where visible, the cast iron pipe appears to be in fair condition. Smaller pipe sizes appear to be copper.

### Existing Conditions

### FIXTURES:

The water closets are a combination of floor mounted vitreous china with manual flushometers or tank type.

Urinal is wall hung vitreous china with manual flushometer.

*P1 Floor mounted, tank type*

*P2 Floor mounted, flush valve*

*P3 Urinal, flush valve*

First Floor lavatories are integral with countertop and are equipped with handle faucets. Second Floor lavatory is wall hung vitreous china with single handle faucet; faucet is fed by cold water only.

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Staff sink is stainless steel, counter mounted, with two handle faucet and is equipped with a garbage disposal.

*P4 First Floor lavatory*

*P5 Second Floor lavatory*

*P6 Staff sink*

**WATER SYSTEMS:**

The main domestic water service is located in the basement. The service appears to be 2" in size and includes a 1-1/2" water meter. The main domestic cold-water distribution is 1-1/4" in size.

Water piping is copper with sweat joints. The majority of the piping is not insulated.

Domestic hot water is generated by an electric storage type water heater. Heater is single phase with two 4,500 watt elements and 40 gallons of storage. The hot water system is not re-circulated. There is no thermostatic mixing valve to prevent scalding or expansion tank on the system.

Hot water is supplied to the First Floor bathrooms and staff sink.

There is a reduced pressure backflow preventer on the boiler make-up water connection.

*P7 Domestic water heater*

*P8 Backflow preventer for boiler make-up*

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Marion, Massachusetts
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**DRAINAGE SYSTEMS:**

Cast iron is used for sanitary drainage. The piping is hub and spigot. Where visible, the cast iron pipe appears to be in fair condition. Smaller pipe sizes appear to be copper. There is some PVC piping utilized which is not code compliant and must be replaced.

Roof is sloped with storm water collected by gutters and downspouts. There are no interior rain leaders.

The is an open sump pump located on the basement. Water is ejected through a flexible hose to the adjacent tennis courts.

*P9 Downspout connection below grade*

*P10 Downspout discharging to grade*

*P11 Basement sump pump*

**Natural Gas:**

Natural gas is supplied to the building. Meter is located on the exterior of the building. Gas supplies the heating boiler only.

Gas piping is black steel with screwed joints and fittings.

*P12 Gas meter*

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Marion Town House
Marion, Massachusetts
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**RECOMMENDATIONS:**

Replace all plumbing fixtures with high-efficiency water conserving fixtures.

Provide accessible drinking fountains throughout the building.

Provide new domestic water distribution piping to plumbing fixtures.

Install new gas-fired, high efficiency, condensing water heater with thermostatic mixing valve, expansion tank, and hot water recirculation loop or gas-fired, tankless water heater depending on architectural layouts.

In general, the cast iron drainage piping can be reused even in a major renovation where adequately sized for the intended new use. All PVC pipe must be replaced.

Install new groundwater sump pump and sub-soil drainage system.

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PROJECT: Marion Town House
JOB NO: 610 004 00.00
CLIENT: DVV
DATE: 12/21/2010 BY: CMG

## CONSTRUCTION COST ESTIMATE

| ITEM No. | ITEM OF WORK | PRIORITY | QTY. | UNIT PRICE | PRICE | AREA (G.S.F.) | TOTAL |
|---|---|---|---|---|---|---|---|
| 1 | Remove & replace plumbing fixtures including new domestic water piping | 2 | - | SF | $4.00 | 20,700 | $82,800.00 |
| 2 | Install drinking fountains (1 per floor) | 2 | 3 | EA | $3,500.00 | - | $10,500.00 |
| 3 | Install new water heater | 2 | 1 | L.S. | - | - | $12,500.00 |
| 4 | Install new sump pump and sub-soil drainage system | 2 | 1 | L.S. | - | - | $18,000.00 |
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| | | | | | TOTAL Plumbing System Cost | | *$123,800.00* |

Notes:

1. Priority 1 = 0-1 Year; Priority 2 = 2-5 Years; Priority 3 = 5-10 Years recommended for system improvements.

2. Cost estimates are based on recent project costs with similar Plumbing systems and equipments.

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Marion, MA
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**HVAC - Heating, Ventilation and Air Conditioning:**

**Boiler Room**

- The boiler plant consists of (1) gas fired cast iron boiler. The boilers has a steam heating capacity of 1,075 MBH input and approx. 645 MBH output. The boiler is manufactured by H.B. Smith with burners manufactured by Power Flame. The boiler looks to be about 50 years old and past it's life expectancy.

*M1* *Cast Iron Dual Fuel Boilers* *M2*

- Combustion air is provided by a wood louver in a window opening. The louver is open at all times allowing cold air to enter the building, even when the boiler is off.

*M3* *Combustion Air Louver* *M4*

- Product of combustion is vented out of the building through a steel breeching with barometer relief. The breeching enters a masonry brick chimney.

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*M5* *Breeching and Masonry Brick Chimney* *M6*

- Steam is distributed to cast iron radiators located throughout the building via black steel piping. The steam piping is insulated. Piping exterior appears to be in fair shape. A pipe section would need to be removed to determine the condition of the interior. Condensed steam is piped back to a condensate receptor and pumped back to the boiler. The condensate receptor appears to be in rough shape and past it's life expectancy.

*M7* *Steam Distribution Piping* *M8*

*M9* *Steam Condensate Receptor*

**Office Space Heating, Ventilation and Cooling**

- Space heating is provided by cast iron radiator located at the perimeter of the building. Temperature control is provided by adjustable steam valves located on the radiators. Ventilation is provided to the space via operable windows. Air conditioning of the spaces is provided by window terminal units.

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M10

M11

*Cast Iron Radiators*

M12

M13

*Window Air Condition Terminal Units*

M14 *Operable Windows for Ventilation*

**Restroom Exhaust Systems**

- Restrooms are on localized ceiling exhaust fans controlled by wall mounted light switches.

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*M15 Ceiling Mounted Exhaust Fan*

**Automatic Temperature Controls**

- Space control is provided by radiator mounted manual control valve. Boiler operation is controlled by space mounted thermostat on the main level.

*M16 Wall Thermostat*

*M17 Manual Control Valve*

**RECOMMENDATIONS:**

- The existing boiler is past its service life and should be replaced with a high efficiency gas-fired condensing boiler for improved energy savings.
- The steam piping and radiators should be removed and replaced with insulated hot water supply and return piping and fan coils.
- To air condition the building, a graded mounted chiller would supply chilled water to fan coils fitted out with cooling/heating coils. The piping would be sized for a dual temperature system (2-pipe change over). If simultaneous heating and cool is desired, a 4 pipe system would need to be installed.
- General ventilation would be provided by a centralized air handler located in the basement and ducted to each occupied space via sheet metal ductwork system.
- The existing local thermostat and manual control valves shall be replaced with direct digital control (DDC) system. The DDC system will save energy by managing the HVAC system. The

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DDC system will control space set points, reducing set points during unoccupied times, and turn off equipment not need during unoccupied times.

HVAC SYSTEMS REPORT

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370 Faunce Corner Road, Dartmouth, MA 02747-1217

PROJECT: Marion Town House
JOB NO: 610 004 00.00
CLIENT: DVV
DATE: 12/29/2010 BY: DAH

## CONSTRUCTION COST ESTIMATE

| ITEM No. | ITEM OF WORK | PRIORITY | QTY. | UNIT PRICE | PRICE | AREA (G.S.F.) | TOTAL |
|---|---|---|---|---|---|---|---|
| 1 | New 1500 MBH condensing hot water boiler. | 2 | 1 | EA | $40,110.00 | | $40,110.00 |
| 2 | New Hot water supply and return piping (hanger/insulation valves) | 2 | | SF | $4.00 | 20,700 | $82,800.00 |
| 3 | Install new in-line hot water pumps and VFD | 2 | 2 | EA | $1,500.00 | - | $3,000.00 |
| 4 | New Heating only fan coil units | 2 | | SF | $7.00 | 20,700 | $144,900.00 |
| 5 | Install new Direct digital controls (DDC) | 2 | | SF | $4.00 | 20,700 | $82,800.00 |
| 6 | Install new 5000 CFM central ventilation HVAC unit w/ ERV | 2 | 1 | EA | $45,000.00 | | $45,000.00 |
| 7 | Install new ductwork | 2 | | SF | $8.50 | 20,700 | $175,950.00 |
| 8 | Demolition | 2 | | SF | $0.50 | 20,700 | $10,350.00 |
| 9 | Testing & Balanceing | | | EA | $7,500.00 | | $7,500.00 |
| Air Conditioning | | | | | | | |
| 7 | * Remove existing window AC units and replace with Heating/Cooling Fan coil units (includes additional DDC controls) | 4 | | SF | $9.00 | 20,700 | $186,300.00 |
| 8 | ** Install dual temperature (Heating/cooling) supply and return piping | 4 | | SF | $5.00 | 20,700 | $103,500.00 |
| 9 | *** Install 4 piping (simultaneous heating and cooling) supply and return piping. | 4 | | SF | $8.00 | 20,700 | $165,600.00 |
| 10 | Install new grade mounted 75 ton air cooled chiller | 4 | 1 | EA | $84,750.00 | | $84,750.00 |

| | $/SF | |
|---|---|---|
| **TOTAL HVAC System Cost (Heating only)** | **$28.62** | ***$592,410.00*** |
| **TOTAL HVAC System Cost (Heating/Cooling 2-pipe change over)** | **$38.71** | ***$801,360.00*** |
| **TOTAL HVAC System Cost (Heating/Cooling 4-pipe)** | **$38.71** | ***$801,360.00*** |

Notes:

1. Priority 1 = 0-1 Year (code/life safty issues); Priority 2 = 2-5 Years; Priority 3 = 5-10 Years recommended for system improvements; Priority 4 = Owner option.
2. Cost estimates are based on recent project costs with similar HVAC systems and equipment.
3. * For Heating and cooling final totals heating only fan coils have been removed and replaced with heating/cooling fan coil units
4. ** For Heating and cooling final totals heating only piping has been removed and replaced with dual temperature piping
5. *** For Heating and cooling final totals heating only piping has been removed and replaced with 4-pipe system

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## ELECTRICAL

### ELECTRICAL DISTRIBUTION SYSTEM:

- The existing electrical service panels have been recently upgraded. The service rating is rated at 400 amp, 120/240 volt, 1∅, 3 wire. The equipment is manufactured by Eaton, and is in good condition.

E1 New Electrical Service Panel

E2 Overhead Electric Service Lateral

- The electric service runs overhead to the building. The service equipment is located in the basement.

E3 Older Lighting and Power Panels

E4 Older Lighting and Power Panels with "SER" Server Cable

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- Older lighting and power panels are circuit breaker type and are rated at 120/240 volt, 1∅, 3wire. The panels are located in the basement on opposite wall of service equipment and are in poor condition.
- The existing panelboards are from various manufacturers.
- The service capacity is approximately 320 amps or 76.8 kW, yielding approximately 3.7 watts per square foot. The service will not accommodate an elevator addition.

**INTERIOR LIGHTING SYSTEM:**

E5 Existing Fluorescent Lighting

E6 Fluorescent Strip at Mechanical Spacers

- Existing lighting consists mostly of fluorescent troffers with acrylic lenses.
- Mechanical spaces in the basement have mostly incandescent keyless fixtures present. Fluorescent strips have been added near equipment to provide better illumination.
- Lighting in corridors is similar to offices. Fluorescent 2x4 fixtures have been used with acrylic lenses.

E7 Light Fixtures on 3rd Floor

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Marion, Massachusetts
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- The third floor has incandescent fixtures installed in some areas. Some rooms just have exposed wiring where fixtures were previously installed.
- The Annex Selectman Meeting Room has globe fixtures installed. The lighting level appears low.

**EMERGENCY SYSTEM (BATTERY UNITS):**


E8 Typical Emergency Battery Unit


E9 Lighted Exit Sign

- Emergency lighting throughout the space includes battery units. There is no emergency generator present. The area covered appears adequate for the First and Second Floor. The Third Floor does not have adequate coverage.
- Exit signs on First Floor are illuminated as requred by Code.

**WIRING DEVICES/BRANCH CIRCUITS:**

- The existing receptacles are grounding-type. There have been receptacles added over the years to accommodate computers and other office equipment.
- The quantity of receptacles does not appear appropriate for the amount of equipment at each workstation. Extension cords are being used.

E10 Grounding Type Receptacle

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Marion, Massachusetts
Existing Conditions Systems Report
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- The Third Floor does not appear to have any receptacles.

E11 Romex And Knob and Tube Wiring (Removed) at Basement

- There is a variety of wiring methods used for branch circuits. There is knob and tube wiring in the basement as well as the Third Floor. The knob and tube poses a hazard and should be removed. There is non-metallic sheathed cable present throughout (Romex). Romex is not allowed in assembly-use occupancy areas and where installed in dropped ceilings.

**FIRE ALARM SYSTEM:**

E12 Fire Alarm Control Panel

- The building is equipped with an automatic fire alarm system. The coverage appears minimal. The fire alarm control panel is manufactured by ESL and has five zones. There is an AES Alarm transmitter to the Fire Department Receiving Station.
- Toilet rooms do not have strobe lights installed.
- The existing system is not ADA compliant.

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Marion, Massachusetts
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**TEL/DATA/MISCELLANEOUS:**

- There is an existing Head End located on the Second Floor. The room does have dedicated cooling. The Head End equipment includes a rack with 48 port patch panel and (2) 24 port switches along with cable modem and firewall.

E13 Head End Equipment

E14 Servers at Head End Room

- There is a Verizon demarcation in the basement located near the electrical service equipment. The demarcation serves the Marion Town House and Library.
- There is a telephone switch in the basement. The telephone switch appears to serve the Marion Town House only.

E15 Telephone demark at Basement


E16 Telephone Circuits to Library

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- There is a security system present and appears to be functioning properly. The control panel is on the First Floor.

**RECOMMENDATIONS:**

**ELECTRICAL DISTRIBUTION SYSTEM:**

- The total square footage, not including the Annex, is approximately 20,700 s.f., yielding approximately 3.7 watts/s.f.

  New construction service ratings are generally designed for a demand load of 15 watts/s.f. We recommend a new service and equipment rate at 800 amps, 120/208V, 3Ø, 4W. The location of the service can remain in the basement, however, the service conduits have to slope away from the building. A dedicated electrical room should be provided. The room should be (2) hour rated. A 3 phase service will be required with the addition of an elevator.

**INTERIOR LIGHTING SYSTEM:**

- New lighting should be low glare type fixtures such as Indirect 2'x4' with perforated shield. Where high ceiling may be present, pendant indirect fixtures should be installed.
- Daylight sensors should be considered in areas with high windows. The quantity of daylight in the building is above average, and can be used to reduce energy consumption.

**EMERGENCY LIGHTING SYSTEM:**

- The building should have the emergency battery units upgraded to include toilet rooms, exit discharge at exterior, and intervening spaces without natural lights. A generator should be considered as an alternative.

**SITE LIGHTING SYSTEM:**

- New fixtures for area lighting should be installed. Building mounted fixtures should be installed on rear and sides of the Marion Town House. The lighting fixtures should be period type to match the historic character of the building.

**WIRING DEVICES:**

- Each large office/meeting room should have a minimum of (2) duplex receptacles per wall and (2) double duplex receptacles at computer workstations. Offices should have a minimum of (1)

GARCIA • GALUSKA • DESOUSA
Consulting Engineers Inc.

Marion Town House
Marion, Massachusetts
Existing Conditions Systems Report
J#
L#32453 /Page 7/December 17, 2010

duplex receptacle per wall, (1) double duplex receptacle at computer workstations, and dedicated outlets for equipment.

**FIRE ALARM SYSTEM:**

- A new fire alarm system with voice evacuation should be provided. The new system should be addressable type. The system must be ADA compliant.

**TEL/DATA/MISCELLANEOUS:**

- A new closed circuit TV system should be installed with IP cameras and video server that is connected to the local area network.
- A new Main Distribution Frame (MDF) should be provided and located centrally in the facility. The location needs to be well coordinated with the program; the Second Floor existing location already appears to be the best location.
- A new telephone system with voice-over IP should be provided.

GARCIA • GALUSKA • DESOUSA
Consulting Engineers Inc.
370 Faunce Corner Road, Dartmouth, MA 02747-1217

PROJECT: Marion Town House
JOB NO: 610 004 00.00
CLIENT: DVV
DATE: 12/21/2010 BY: CGD

## CONSTRUCTION COST ESTIMATE

| ITEM No. | ITEM OF WORK | PRIORITY | QTY. | UNIT PRICE | PRICE/S.F. | AREA (G.S.F.) | TOTAL |
|---|---|---|---|---|---|---|---|
| 1 | Remove and replace the existing fire alarm system with a new state of the art addressable fire alarm to comply with life safety requirements. | 1 | | SF | $2.50 | 20,700 | $51,750.00 |
| 2 | Replace existing exit signs. Furnish and install additional exit signs and emergency lights to comply with life safety requirements. | 1 | | SF | $0.25 | 20,700 | $5,175.00 |
| 5 | Replace existing panels and feeders & new elec service. | 3 | | SF | $3.50 | 20,700 | $72,450.00 |
| 5 | New HVAC equipment wiring | 3 | | SF | $1.50 | 20,700 | $31,050.00 |
| 6 | Provide additional receptacles for computer workstations with new panelboards with surge protection. | 3 | | SF | $1.00 | 20,700 | $20,700.00 |
| 6 | Remove existing Romex and replace with MC Cable | 3 | | SF | $2.00 | 20,700 | $41,400.00 |
| 8 | Furnish and install an up-to-date security system with CCTV cameras, door contacts, key pads, etc. | 3 | | SF | $3.00 | 20,700 | $62,100.00 |
| 9 | Furnish and install new lighting and branch circuits | 3 | | SF | $4.00 | 20,700 | $82,800.00 |
| 9 | Furnish and install new Exterior lighting. | 3 | 6 | $750 | | | $4,500.00 |
| 10 | Add 2 hour rated electrical/tel/data rooms. | 3 | 3 | $5,000 | | | $15,000.00 |
| 20 | Add occupancy & daylighting controls. | 3 | | SF | $0.50 | 20,700 | $10,350.00 |
| 20 | New Voice Data infrastructure | 3 | | SF | $4.00 | 20,700 | $82,800.00 |
| | | | | **TOTAL Electrical System Cost** | | | ***$480,075.00*** |
| | | | | **TOTAL Electrical System Cost, $/SF** | | | ***$23.19*** |

Notes:

1. Priority 1 = 0-1 Year; Priority 2 = 2-5 Years; Priority 3 = 5-10 Years recommended for system improvements.

2. Cost estimates are based on recent project costs with similar Electrical systems and equipments.

WATER INFILTRATION ASSESSMENT

ENGINEERING, INC.
ENGINEERS
SURVEYORS

266 MAIN ST.
WAREHAM, MA
02571
TEL 508.295.6600
FAX 508.295.6634

gaf@gaf-eng.com

December 2, 2010

Town of Marion
2 Spring Street
Marion, MA 02738
Attn: Mr. Paul Dawson, Town Administrator

Re: Marion Town House
Water Infiltration Assessment Report
G.A.F. Job No. 7622

Dear Mr. Dawson:

Enclosed is our report on the sources of water infiltration into the basement of the Marion Town House. The report addresses the potential sources of water infiltration into the basement of the building and provides recommendations on remediation. Once you have had an opportunity to review the report we should meet to discuss it in more detail. The recommendations can be implemented at anytime or carried out in phases as funding permits.

Thank you for the opportunity to provide consulting services on this project.

Very Truly Yours,
**G.A.F. Engineering, Inc.**

William F. Madden, P.E.

WFM/lmf

Enclosure

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WATER INFILTRATION ASSESSMENT

# MARION TOWN HOUSE
# WATER INFILTRATION ASSESSMENT REPORT

**General**

G.A.F. Engineering, Inc. conducted an analysis of the sources of water infiltration in the basement at the Marion Town House. This report was requested in response to the recommendations suggested by OccuHealth, Inc. relative to the Mold Assessment Report prepared and dated December 3, 2009. Our report is based on visual observations of site conditions surrounding the building as well as an exploration of subsurface soil conditions.

**Inspection**

On October 22, 2010 staff from G.A.F. Engineering, Inc. conducted a site inspection to evaluate site drainage, site grading and other conditions on site, which contribute to the source of water infiltration into the building. Three (3) test pits were excavated on site in an effort to determine an estimated seasonal high water table (ESHWT). The existing town house is constructed on a granite block/stone and mortar foundation. The town house was constructed in the late 1800's and as such it appears surface water runoff infiltrates into the basement through cracks and seams associated with this type of construction.

**Building Exterior**

The primary source of stormwater infiltration is a result of a roof drainage system consisting of gutters and downspouts, which are in disrepair. A large number of downspouts are not connected to the gutter system. Consequently much of the roof runoff discharges directly at grade and ultimately finds its way into the building through the cracks and seams of the mortar joints. When significant ponding occurs water can also flow through deteriorated window frames.

**Typical disconnected downspout**

A narrow concrete apron was constructed immediately adjacent to the building foundation along most of its perimeter. It is unknown why this apron was constructed. It does appear that the apron placement may have been one of the initial corrective measures undertaken by the town to remediate the infiltration problem. The north side of the building under the handicap access area leading from the parking lot is absent of a concrete apron.

**Typical concrete apron adjacent to foundation. Note rotted window frame**

Many of the downspouts are collected in an underground collection system. It is believed that portions of the on-site collection system is connected to the municipal storm drainage system on Spring Street. The remaining downspouts discharge at grade onto the concrete apron or directly to grade. Most of this water infiltrates into the ground due to the flat topography of the site.

**Downspout discharging at grade under the handicap access ramp**

1

WATER INFILTRATION ASSESSMENT

**Site Grading**

In general the site drainage is directed away from the building. The exception is the west side of the building where site drainage from the athletic fields, parking lot and tennis courts drain toward the building. The athletic fields, tennis court and parking lot comprise roughly 5 acres. This area drains to an existing catch basin located in the northeasterly corner of the parking lot. A 12-inch diameter pipe conveys stormwater to Spring Street. Given the size of the drainage area it appears that this drain line may be inadequate to convey peak stormwater flows. The location of this line also leads us to believe that the diameter of the drain line is diminished due to flat slope and the possibility of root intrusion into the pipe.

**Catch basin in corner of parking lot**

**Soils**

Three test pits were excavated on-site to determine the Estimated Seasonal High Water Table (ESHWT). The test pits were excavated on-site by staff of the Marion DPW as shown on the enclosed sketch. Test pits were excavated to a depth of approximately 6-7 feet essentially to correspond to the basement floor elevation. No groundwater was encountered in any of the test pits, however mottles were observed between 40 and 60 inches below existing grade. This mottling suggests the seasonal high-water table exists at these elevations. The basement walls are likely to be subjected to this ESHWT on a seasonal basis

**Conclusion**

The conditions at the site indicate that the sources of infiltration of water into the basement result primarily from roof runoff. This water ponds at the perimeter of the building and as it infiltrates into the soil finds its way into cracks and joints of the foundation wall.

Groundwater infiltration plays a role as well although it is expected to be seasonal in nature, say the months of December through Mid May. The single sump pump located in the basement is more than likely insufficient to capture and discharge the quantity of groundwater, which finds its way into the building.

The single catch basin at the northeast corner of the parking lot appears insufficient to drain the volume of runoff developed on the site and adjacent to it. It is further likely that the carrying capacity of the existing storm drain line is diminished due root intrusion in the drain line.

**Recommendations**

Our recommendations necessary to remediate the infiltration are as follows.

1.) Repair, replace and/or connect downspouts to gutters at all locations.
2.) Replace the existing parking lot catch basin and drain line to Spring Street with an adequately sized pipe. Install a new manhole on the Spring Street storm drain where the upgraded pipe connects to the Spring Street storm drain. Additional drainage structures may be required.
3.) Install a perimeter drain immediately adjacent to the concrete apron at the perimeter of the building. A perforated pipe in a stone trench is a potential solution.
4.) Connect the perimeter drain to the upgraded on-site storm drain line.
5.) Add additional sumps and sump pumps in the building's basement. These sump pumps can lower the localized ESHWT and will keep water below the floor slab (where it exists).

The foregoing recommendations will eliminate the majority of the source of the surface water runoff, which enters the building.

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2

WATER INFILTRATION ASSESSMENT

# MARION TOWN HOUSE

## 2 Spring Street - Marion, MA

Progress

OWNER

## TOWN OF MARION

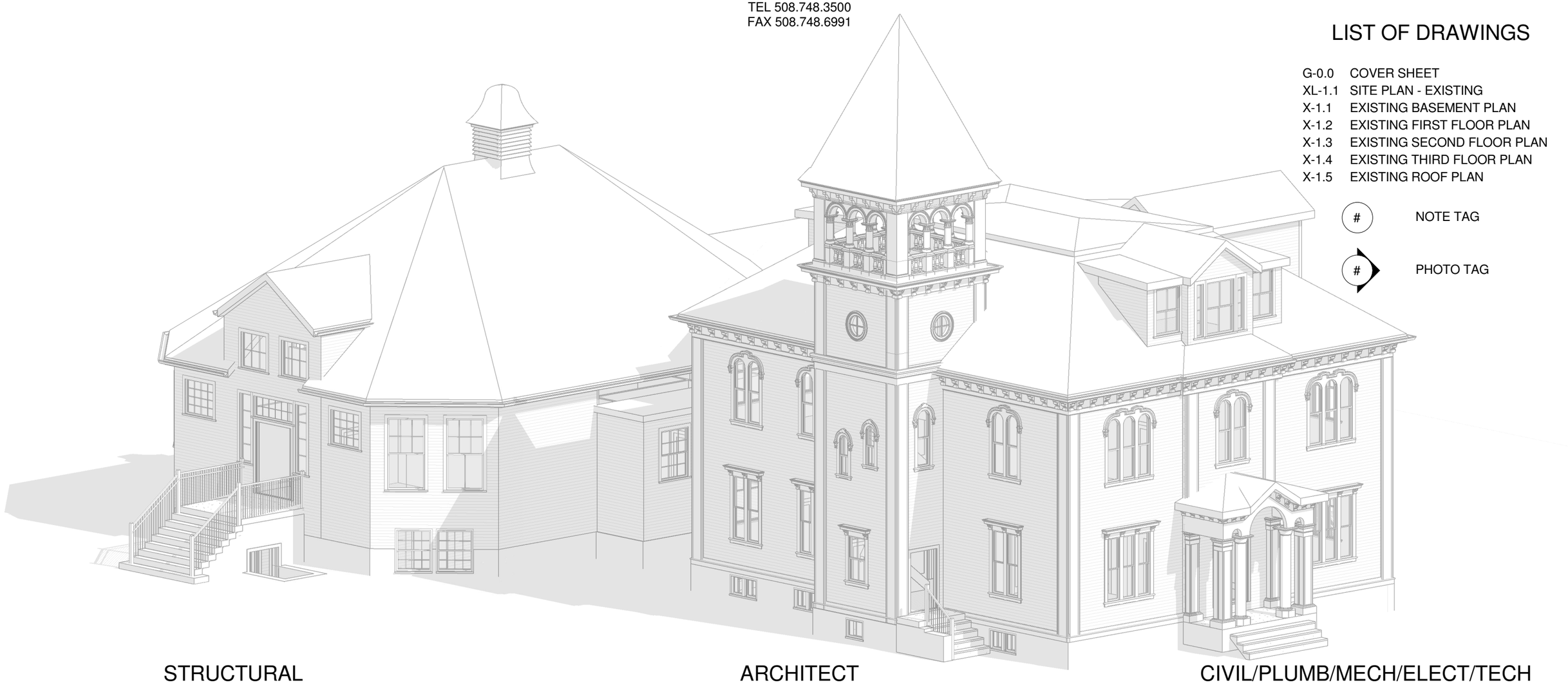
2 SPRING STREET
MARION, MA 02738
TEL 508.748.3500
FAX 508.748.6991

### LIST OF DRAWINGS



(#) NOTE TAG

(#) PHOTO TAG



STRUCTURAL

## BOSTON BUILDING CONSULTANTS

175 DERBY STREET
HINGHAM, MA 02043
TEL 617.542.3933
FAX 617.426.8922

ARCHITECT

## DURLAND - VAN VOORHIS ARCHITECTS

628 PLEASANT STREET - SUITE 322
NEW BEDFORD, MA 02740
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FAX 508.993.6581

CIVIL/PLUMB/MECH/ELECT/TECH

## GARCIA GALUSKA DESOUSA

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dv architects


# COVER SHEET

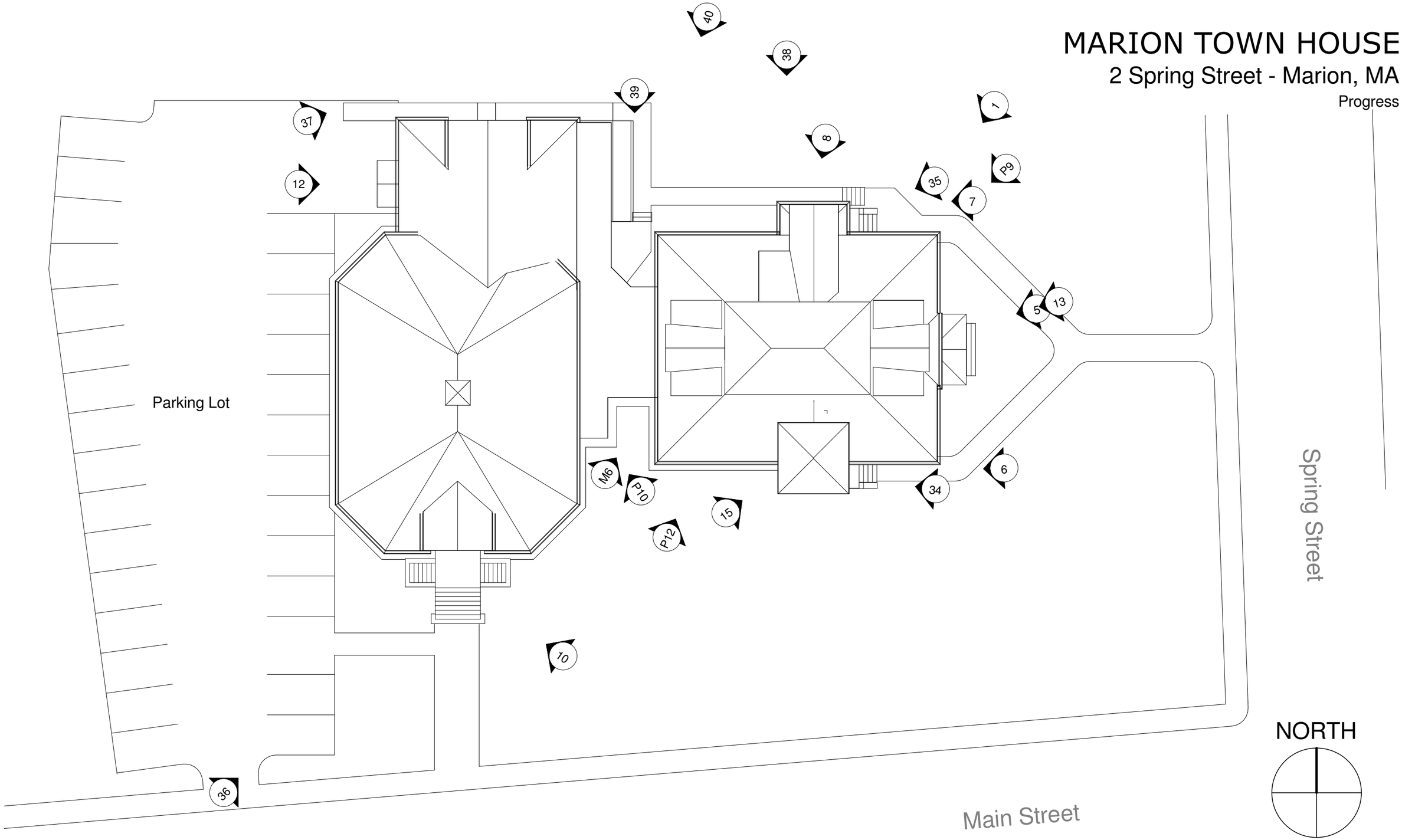
1/16" = 1'-0"

G-0.0

# MARION TOWN HOUSE

## 2 Spring Street - Marion, MA

Progress

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# SITE PLAN - EXISTING

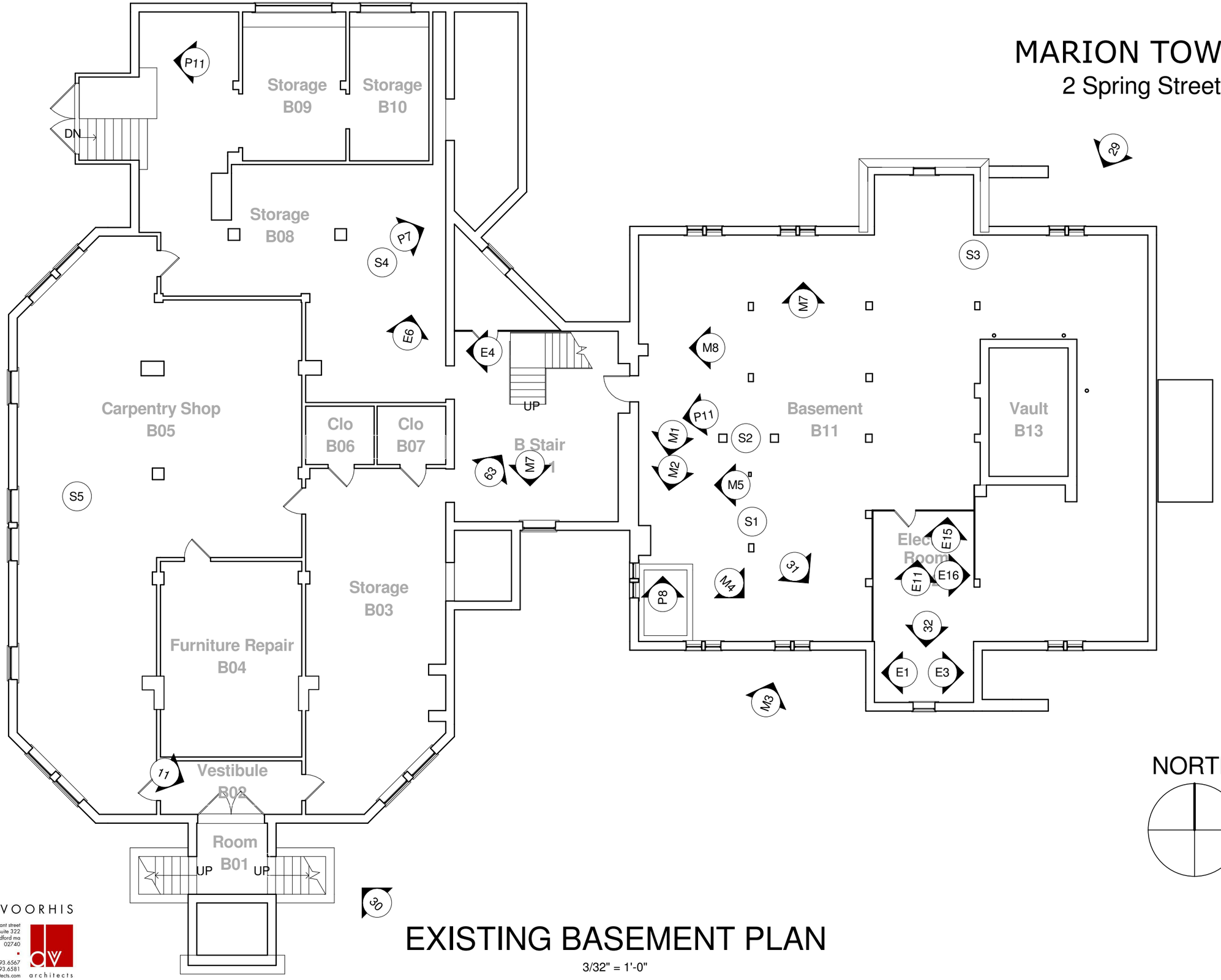
1" = 20'-0"

XL-1.1

# MARION TOWN HOUSE

2 Spring Street - Marion, MA

Progress




NORTH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# EXISTING BASEMENT PLAN

3/32" = 1'-0"

X-1.1

# MARION TOWN HOUSE

## 2 Spring Street - Marion, MA

Progress

Storage 119
Storage 120
Town Administrator 118
Women 121
Clo 115
Board of Health 114
BoH Sto 116
Mail Room 117
Upper Hall 122
Treasurer 123
Room 124
Clo 125
Town Clerk 127
Vault 1 128
Vault 2 129
Room 130
Clo 1 132
Assessor 131
Health Agent 113
Hall 103
Staff Room 104
Kitch 105
Office 101
Bldg Insp 134
Building Dept 133
BoH Nurse 112
Meeting Room 111
Room 106
Room 110
Room 108
Con Comm 107
Room 109
DN
UP

NORTH

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# EXISTING FIRST FLOOR PLAN

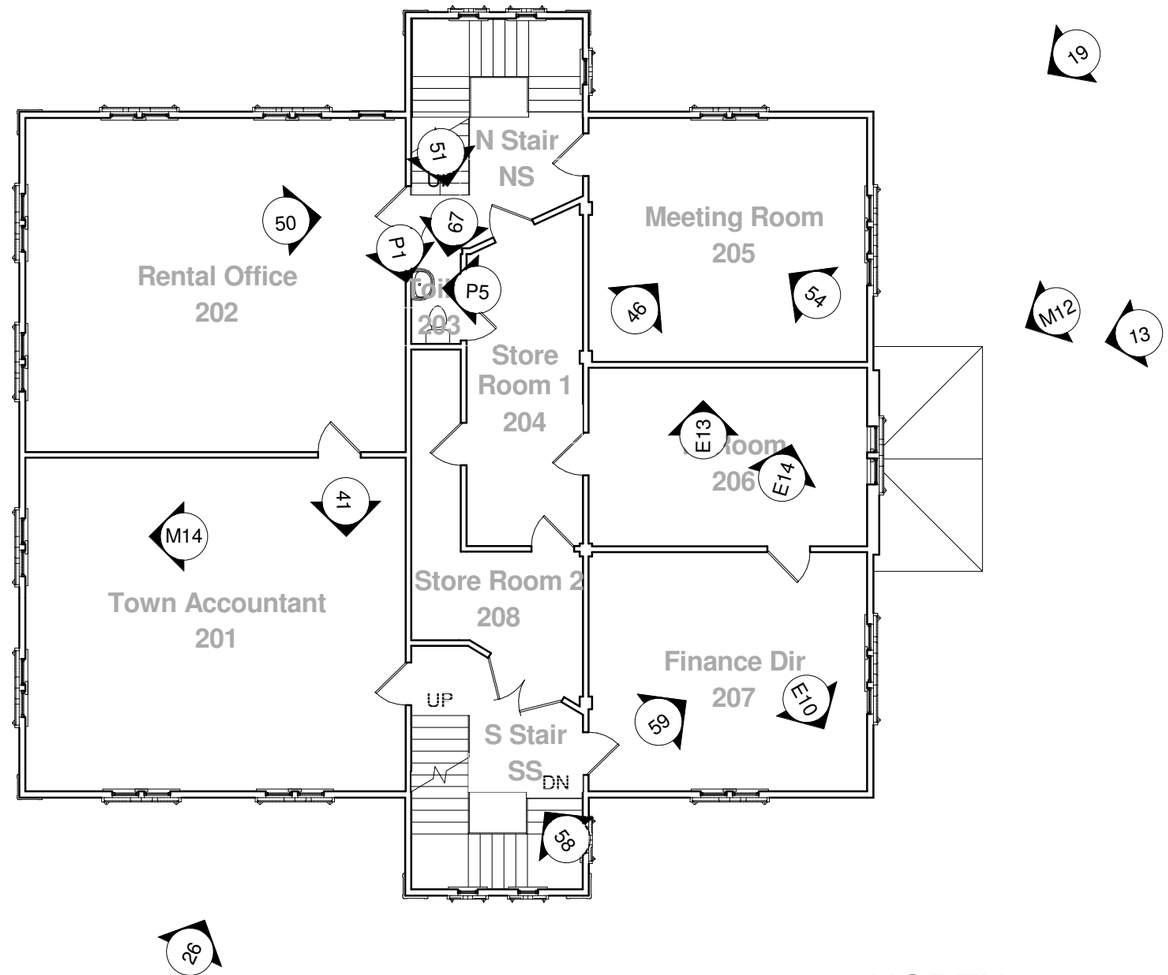
3/32" = 1'-0"

X-1.2

# MARION TOWN HOUSE

## 2 Spring Street - Marion, MA

Progress

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# EXISTING SECOND FLOOR PLAN

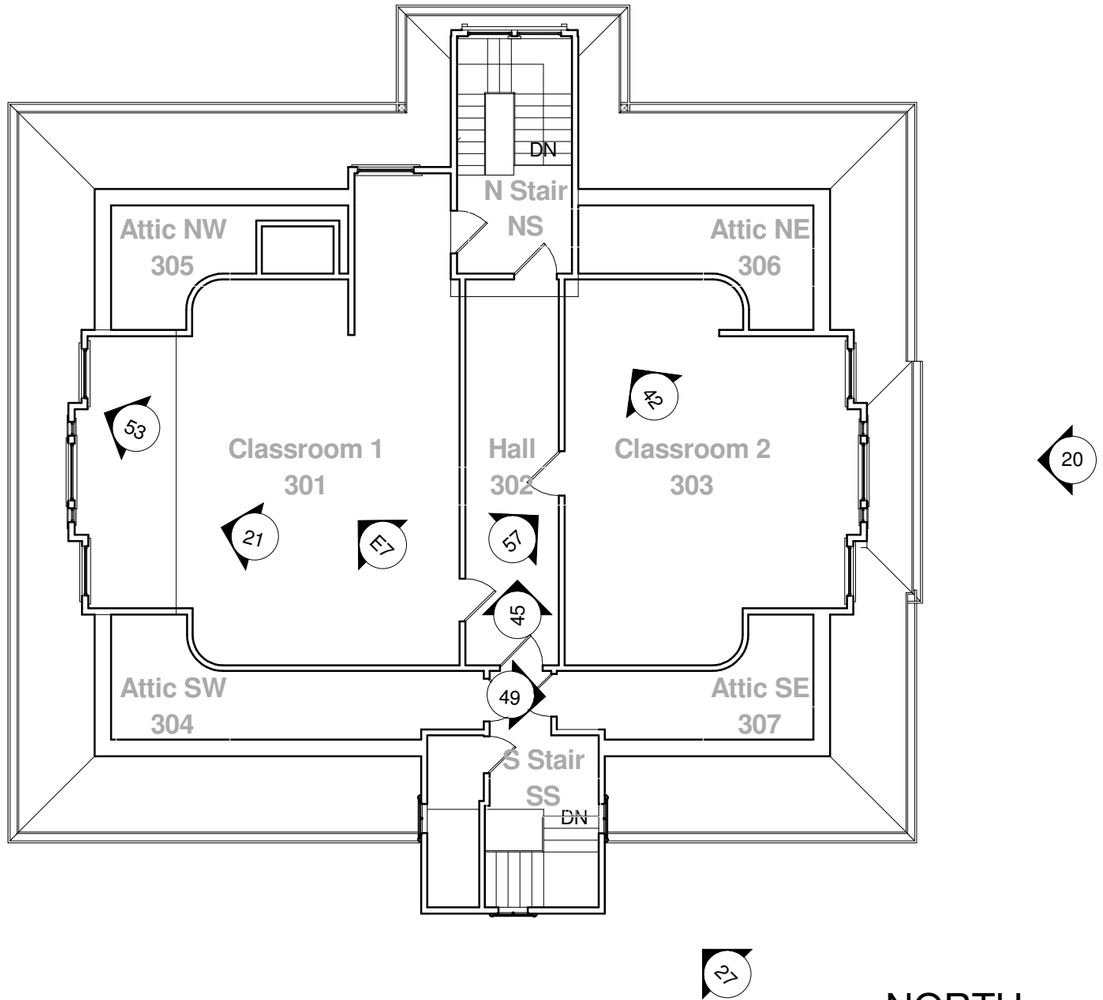
3/32" = 1'-0"

X-1.3

# MARION TOWN HOUSE

## 2 Spring Street - Marion, MA

Progress

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# EXISTING THIRD FLOOR PLAN

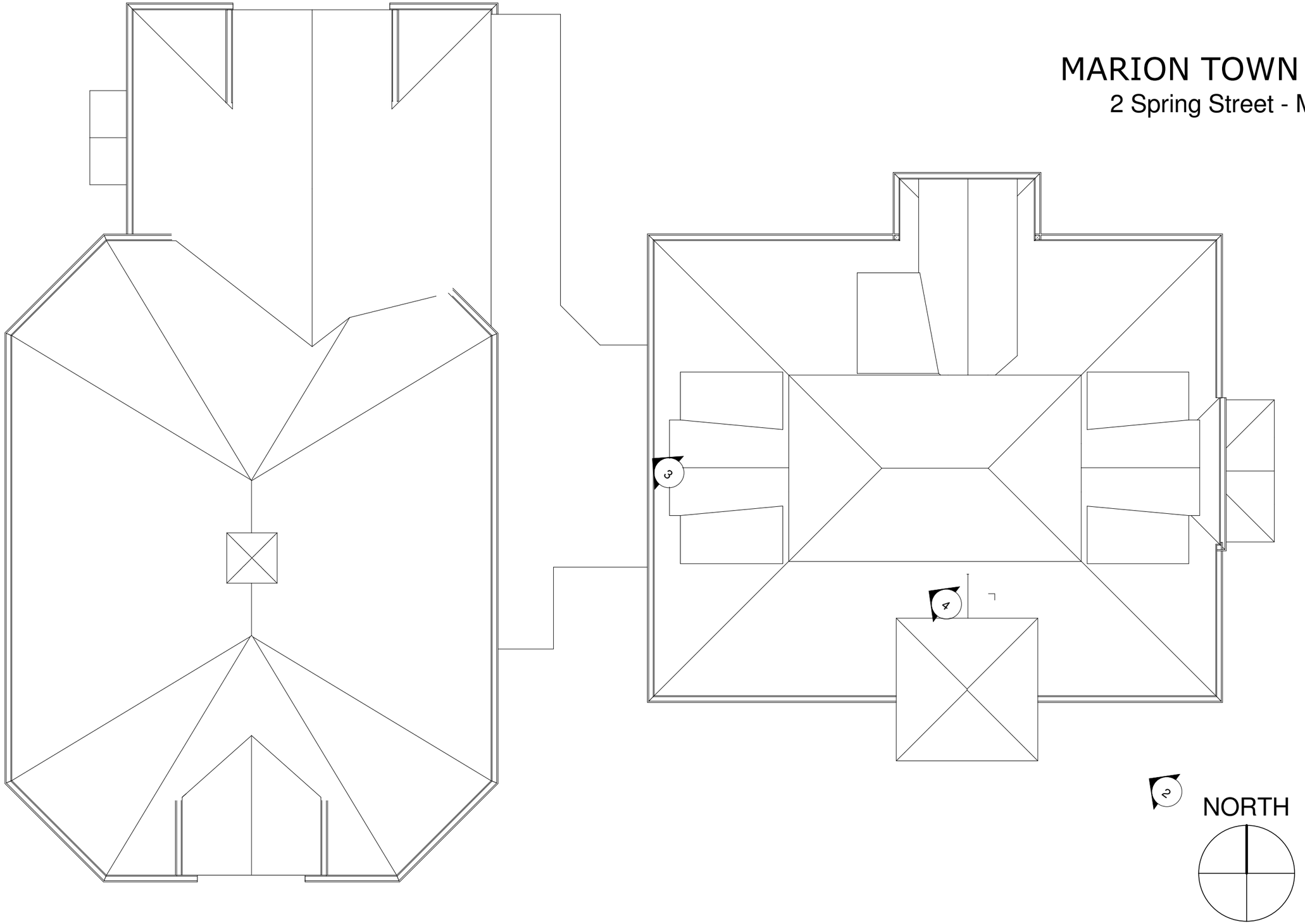
3/32" = 1'-0"

X-1.4

# MARION TOWN HOUSE

## 2 Spring Street - Marion, MA

Progress

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# EXISTING ROOF PLAN

3/32" = 1'-0"

X-1.5